

Amendments to the Claims

Claims 1-19 (cancelled)

Claim 20 (currently amended): Apparatus to form a hollow protrusion from heated thermoplastic film, wherein where said hollow protrusion comprises a tip bounded at least in part by intersects said heated thermoplastic film, said entire intersection comprising the locus of a fault line, including the apparatus comprising:

(a) a supply of thermoplastic film, said film as supplied having an uncompressed film thickness T;

(b) means to controllably heat a section of said film;

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(c) ~~means to transfer said heated film section to the locus of the center of said apparatus;~~

(c) ~~(d) punch means comprising a tip~~ fault line forming portion with a shallow frusto-conical formation at the base of said tip portion extending from a shaft; and

(e) ~~resiliently mounted film clamp means with a central hole through which said punch member may pass;~~

(f) ~~guided mounting plate means to which said clamp means and punch means are concentrically mounted with said punch means located beneath the clamp face of said resilient clamp means and concentric with its central hole to reciprocatingly and controllably advance and retract said resiliently mounted film clamp means and punch means with respect to a female die; and~~

(d) ~~(g)~~ a female die having an accurately bored hole in a ~~stationary flat~~ die-plate located in accurate alignment with said punch means, said female die having a shoulder; ~~said bore diameter so dimensioned that when the punch means is advanced said bore rim would be in accurate alignment with said shallow frusto-conical formation at the base of the punch tip and if advanced to contact said shallow frusto-conical formation the locus of said contact would be a circle located approximately centrally between the larger base circle and the smaller end circle of said shallow frusto-conical formation~~

wherein the punch means has a first position in which it is not in contact with the film and a second position in which it is fully advanced against said film; and

wherein in said second position said fault line forming portion of said punch means is advanced to a distance D from said shoulder of said female die, with said film therebetween, said distance D being less than said uncompressed film thickness T, such that the fault line forming portion and the shoulder compress the film in that location, thereby forming said fault line.

Claims 21-24 (cancelled)


Claim 25 (new): The apparatus of claim 20, wherein the fault line forming portion comprises a tapered surface.

Claim 26 (new): The apparatus of claim 25, wherein the fault line forming portion comprises a frusto-conical surface.

Claim 27 (new): The apparatus of claim 20, wherein the fault line forming portion comprises a rounded surface.

Claim 28 (new): The apparatus of claim 27, wherein the fault line forming portion comprises a spherical surface.

Claim 29 (new): The apparatus of claim 20, wherein said female die is self-centering and self-aligning with the punch means.

 Claim 30 (new): The apparatus of claim 20, wherein said female die is spring-loaded.

Claim 31 (new): The apparatus of claim 20, further comprising a micrometer punch adjustment mechanism and an anvil adjustable stop mechanism for controlling the advancement of the punch means against the shoulder.

Claim 32 (new): Apparatus to form a breakaway section from heated thermoplastic film, wherein said breakaway section is bounded at least in part by a fault line, the apparatus comprising:

- (a) a supply of thermoplastic film, said film as supplied having an uncompressed film thickness T ;
- (b) means to controllably heat a section of said film;

(c) a punch comprising a fault line forming portion; and

(d) a die having a shoulder;

wherein the punch has a first position in which it is not in contact with the film and a second position in which it is advanced against said film; and

wherein in said second position said fault line forming portion of said punch is advanced to a distance D from said shoulder, with said film therebetween, said distance D being less than said uncompressed film thickness T , such that the fault line forming portion and the shoulder compress the film in that location, thereby forming said fault line.

Bl Claim 33 (new): The apparatus of claim 32, wherein the fault line forming portion comprises a tapered surface.

Claim 34 (new): The apparatus of claim 33, wherein the fault line forming portion comprises a frusto-conical surface.

Claim 35 (new): The apparatus of claim 32, wherein the fault line forming portion comprises a rounded surface.

Claim 36 (new): The apparatus of claim 35, wherein the fault line forming portion comprises a spherical surface.

Claim 37 (new): The apparatus of claim 32, further comprising a micrometer punch adjustment mechanism and an anvil adjustable stop mechanism for controlling the advancement of the punch against the shoulder.

Claim 38 (new): Apparatus to form a hollow protrusion from heated thermoplastic film, wherein said hollow protrusion comprises a tip bounded at least in part by a fault line, the apparatus comprising:

(a) a supply of thermoplastic film, said film as supplied having an uncompressed film thickness T ;

(b) means to controllably heat a section of said film;

(c) a first punch member having a substantially flat end surface and a second punch member having a fault line forming portion; and

(d) a female die having an accurately bored hole in a die-plate located in accurate alignment with said first punch member and said second punch member, said female die having an anvil with a substantially flat end surface and a shoulder;


wherein the first punch member and second punch member have a first position in which they are not in contact with the film and a second position in which they are both fully advanced against said film; and

wherein in said second position said fault line forming portion of said second punch member is advanced to a distance D from said shoulder of said female die, with said film therebetween, said distance D being less than said uncompressed film thickness

T, such that the fault line forming portion and the shoulder compress the film in that location, thereby forming said fault line.

Claim 39 (new): The apparatus of claim 38, wherein the fault line forming portion comprises a tapered surface.

Claim 40 (new): The apparatus of claim 39, wherein the fault line forming portion comprises a frusto-conical surface.

 Claim 41 (new): The apparatus of claim 38, wherein the fault line forming portion comprises a rounded surface.

Claim 42 (new): The apparatus of claim 41, wherein the fault line forming portion comprises a spherical surface.

Claim 43 (new): The apparatus of claim 38, further comprising a micrometer punch adjustment mechanism and an anvil adjustable stop mechanism for controlling the advancement of the punch against the shoulder.